

THE WINSTON CHURCHILL MEMORIAL TRUST OF AUSTRALIA

Report by – Alan Hodgson – 2007 Churchill Fellow

To study Sicilian-style green olive processing and waste management – Italy.

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Signed: Alan Hodgson

Dated: 01/01/08

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INTRODUCTION

Sicily produces some of the better quality green olives in the Mediterranean utilising a process of cracking the olives and traditional brining, minimising waste through a recycling process in the final bottling. The Fellowship allowed me to travel to Sicily and Italy to learn and observe the combination of traditional processing of green olives in state of the art factories.

I wish to extend my appreciation to the Churchill Trust to providing me with the opportunity to study an area of olive production that is not utilised in Australia and that will benefit the local industry and the environment.

I also wish to acknowledge the support of the Olive Care Australia, provided by Mr Gino Russo, and Queensland Olive Council, provided by President Mr Ian Roy. Mr Russo's local knowledge of Sicilian olive industry and his interpreter skills ensured access to facilities and olive processing at a very detailed level. In Italy the support of Mr Brain Chatterton was gratefully appreciated in terms of grove management for table olives.



Alan sitting on the stump of an olive tree in the Valley of the Temples, Sicily, probably a thousand years old.

Executive Summary:

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The fellowship travel was undertaken between 29th October to 3rd December 2007. The aim of the fellowship was to study Sicilian-style green olive processing and waste management. I visited farms and processing facilities in Sicily, from Mount Etna over to the Trapani coastal areas. An essential part of the study was to learn the olive varieties that are utilised in the green olive production, that lend themselves to the process of cracking and brining while maintaining traditional flavour, colour and confirmation. The factories allowed close inspection of their processing practices and were very open to sharing methods and information, enabling me to understand their waste management systems, their cracking processes, and their environmental principles for brine recycling. The experiences I had in grove management in Umbria offered me practical knowledge and skills in traditional table olive tree care and seasonal management practices.

Highlights:

- Visit to Ragolive in Catania, Sicily. Mr Francesco Giuffrida, Responsabile Commerciale. Manages a large modern factory on the side of Mount Etna utilising the traditional methods of processing incorporating modern environmental waste management.
- Meeting and factory introductions with Dr Francesco Guarasci, Dirigente Responsabile, Regione Siciliana, (Department of Agriculture in Sicily), in Agrigento. Not only did he provide us with introduction to table olive processing facilities but he also doubled up with tourism through the Valley of the Temples at Agrigento.
- Visited Franti, a olive processor near Mazara. Mr Bascio Antonino, Presidente, provided inspection of his facilities and tasting of his table olive products.
- Visit to Gruppo Curaba at Castelvetro. This facility handles large quantities of green olives and has some of the largest holding bins I've ever seen.
- Visit to Olis sri, at Partanna. Lorenzo Geraci manages and older style processing facility for green olives.
- Visit to the Olive and Oil Museum at Torgiano in Italy.
- Observing olive tree pruning with Luigi Fantoni at Montegabbione in Umbria.

Major lessons and conclusions:

- The process learnt in Sicily for processing green olives can be easily introduced into the Australian olive industry, with some modifications to facilities.
- Picking olives in their green state minimised the attack on fruit by pests, minimises pest control, and lends to easier harvesting.
- The waste management processes maximises recycling of mother brines and reduces impact on environment.

Implementation and dissemination:

- The methods and practices will be introduced into this year's harvest of table olives in our geographical area.
- Report will be disseminated through Olive Industry magazine's and websites.
- Techniques for grove management will be demonstrated at Olive Associations Field Days.

Fellowship Program:

29th October – 5th November 2007

Travelled to Rome from Sydney. Visited cultural sites within the centre of Rome, collected information on history, culture, significant sites and refined itinerary for Sicilian leg of study tour. Arranged visit with Mr Mauro Meloni, Unaprol, Integrated Approach to Sustainable Olive Oil and Table Olive Production, Rome.

5th November – 8th November 2007

Travelled to Catania and visited Ragolive, Mount Etna and surrounding groves, and Murgo.

9th November – 24th November 2007

Based at Capo D' Orlando in Sicily visited the following facilities and gathered information from:

- Meeting and factory introductions with Dr Francesco Guarasci, Dirigente Responsabile, Regione Siciliana, (Department of Agriculture in Sicily), in Agrigento. Franco provided books and resources on olive and other local products being promoted by the Sicilian Dept of Agriculture.
- Visited Franti, olive processing facility near Mazara. Mr Bascio Antonino, Presidente. Producing green olives for the Japanese export market.
- Visit to Gruppo Curaba at Castelvetrano. Modern green olive processor targeting the export market.
- Visit to Olis sri, at Partanna. Lorenzo Geraci manages and older style processing facility for green olives.
- Sampled traditional west coast Sicilian cuisine at Leon D'Oro at Agrigento.
- Visited Frantoio Palazzolo at Saint Angelo de Brolo. Giuseppe Palazzolo provided tasting of his families green olive specialities.
- Visited local groves and frantoios in Naso, Malo and Sciacca.

24th November – 25th November 2007

Travelled from Capo D' Orlando to Rome and then onto Chiusi, picked up car and travelled to Castel di Fiori in Umbria.

25th November – 30th November 2007

Visited groves, cultural sites and museums, processing facilities within Umbria.

- Il frantoio at Monteleone d' Orvieto. A frantoio run by a family that services all the small groves around the district. Mario Stella runs a very modern and efficient facility.
- Visited Orvieto, Ficulle, Panicale, Castiglione d' lago Trasimeno, Torgiano, Marsciano, Montegabbione and Fabro. Looking at grove management, history of olive processing, and varieties grown.
- Visit to the Olive and Oil Museum at Torgiano in Italy.
- Observing olive tree pruning with Luigi Fantoni at Montegabbione in Umbria.
- Escorted tour of local olive groves in the Montegabbione area with Brain Chatterton, Pulcini Press and ex-pat Aussie, producer of publications related to olive growing in Italy.

30th November – 3rd December 2007.

Return travel to Australia from Umbria to Rome, then Brisbane.

Fellowship Program – lessons learnt.

Olive Cultivars.

There are two cultivars used for commercial table olive production in Sicily. Although there are other cultivars used for small production small home style production. The primary cultivar in the east – Etna region, is Nocellara del Etna, which has DOP status for that area. DOP translates to Protected Designation of Origin in this case the Mount Etna region.

In the north west and western part of Sicily the primary cultivar is Nocellara del Belice, which also has DOP status for that area. These two cultivars are related to the Nocellara del Etna, being slightly smaller in size than Nocellara del Belice. These olives are ovoid shape similar to a Verdale olive and have a good pit to flesh ratio.

Growing conditions.

Nocellara del Etna is grown on the slopes of Mt Etna and surrounding hills, right to the edge of the sea to 500 metre above sea level. They grow mostly in volcanic lava and rocky ground. In general the majority of the groves have DOP status.

Newer groves have been planted in the surrounding hills with much more fertile soil, in a manner to make harvesting easier. These groves also have DOP status using approved cultivars. The climate is typically Mediterranean with hot summers, low rainfall and cold winters.

Nocellara del Belice are grown in the fertile hills and valleys in the north west, from 15 metres to 150 metres above sea level. Here the temperatures are more moderate and with good rainfall produce top quality table olives. Only selected areas of western and northern Sicily groves have DOP status.

Pruning and shaping table olive trees.

The Sicilians have certainly mastered the art of pruning their trees to make hand harvesting easier. The centres have been removed and the tops trimmed to be no higher than 3.5 meters. These are in a vase pattern or more commonly now a T-shape. A vase shape has been formed in the older more mature trees and a T-shape more popular in newer groves. The T-shaped trees are more suitable for mechanical harvesting, which is being slowly introduced to the flatter areas of Sicily. At present the trees are kept low to allow harvesting by hand, off the ground and without use of ladders.

In older regenerating groves three or four suckers are grown from the base of an existing tree, eventually the old tree is removed leaving the three or four young trees, in a vase shape which aids harvesting in the future. By strictly keeping to the 3-4 main suckers the resulting tree has a large circumference of olive foliage (described as a skirt) and hence easily harvested fruit.

Harvesting.

Harvesting table olives at present is all done by hand picking. Mechanical harvesting with rakes and shakers has been trialled but damaged the fruit making it unsuitable for table olive processing.

The fruit is picked in the morning until lunch time, the olives are then delivered to the processing facility late afternoon or early evening. The olives are transported in 20 to 400 kilo bins. On arrival the olives are checked, weighed and logged to the grower.

The olives are green mature when picked, any colour change, bird strike or olive fly damage is rejected and used for oil production.

The fruit is selectively picked direct into picking bags then into larger crates with the pickers name identified, so that a daily tally is kept for each picker and logged to the specific grove, and used to calculate payment.

The tress are picked twice and any remaining fruit used for oil production at a later date.

Grading and sorting.

The select picked olives supplied to the production facility are first checked for quality and contaminants then weighed, and logged. From there the olives are transported via a conveyor to a sorting table to remove any damaged or coloured olives.

The olives are then sized on a rope type grader and collected in bins for each specific size graded. The olives are then passed through a machine that cracks the olive to maximise the surface area for processing. The olives are then placed into 200 kilo barrels in a brine solution.

Brine Solutions.

The mother or parent brines use either sea salt or local rock salt. Sea salt harvested off the Trapani area has an intense salty flavour when tasted directly on the tongue. However it contains no more sodium than local Australian sea salt, therefore processing should replicate the same flavour in Australia.

These brines are made up to suit the olives being processed at the time, and the requirements for later top ups of the barrels. Brines for cracked olives vary for 10 to 12% salt and are acidified to 3.7 to 3.8 ph. This brine is first used when filling the containers and for topping up in the following weeks.

Brines for whole green olives differ from cracked green olives to avoid shrivelling the fruit. A brine of 6% salt is used primarily at a ph of 3.7 to 3.8 and is slowly increased in salt over 1 week to a level of 10% salt. There are no brine changes in the process therefore saving precious water, salt and labour.

These brines are acidified with either food grade lactic acid or citric acid.

Primary process.

Cracked Green olives.

Once the olives have been sorted and graded they then go into the cracking machine which crushes the olive to make a split slightly, sometimes up to 50% through the olive. These olives are then placed in the barrels and are filled with 12% brine with a ph Of 3.7. The barrels are then yarded, date stamped and logged. Every day during the first two week period, then weekly for the next 12 weeks, the brines are topped up and checked for fermentation activity. During this time the lid is left loose just sitting on the brine within the barrel.

At week 12 the fermentation is complete and the olives are ready for the secondary process or sold as is. The lids of the barrels are now firmly screwed down to eliminate any oxygen. At 12 weeks these olives are edible if not a little bitter which is typical of Sicilian olives. They also have a good olives flavour and crispness of a green olive.

Whole Green Olives.

Once the olives have been sorted and graded they go into barrels with brine at 6% salt and ph 3.8. These are then logged and yarded. Each day for the next week the brines are strengthened until a 10% brine is reached. Using a 10% brine at the start of the process will lead to shrivelling and making the olives unsaleable. The olives are checked weekly for the first 12 weeks, topping up the brine to ensure the barrels are full. At week 12 check fermentation is complete, these barrels now have the lid firmly closed to exclude oxygen. The olives are still very bitter and will take a further 20-30 weeks to de-bitter. The brines need to be checked and topped up every 4 weeks.

When de-bittered to taste they can be sold as is or ready for secondary process. Typical green Sicilian whole olives are bitter with a desirable crispness and flavour.

Secondary process.

Olives in brine.

When cracked or whole green olives are de-bittered to taste the secondary process of bottling or packaging is undertaken. For olives in brine or vacuum packed the mother brine is used as a base, this brine is reduced to 9% salt and maintains a ph of 3.7. The brine is filtered and pasteurised to remove yeasts, moulds and undesirable bacteria.

Bottles are filled to the correct weight of olives and either pasteurised brine at 85 degree Celsius is added or cold brine used in the container and then pasteurised. A data logger is used in the bottling process to record pasteurisation temperatures and duration. After pasteurising the bottles are cooled with tepid water, rinsed and appropriate labels fitted for packaging into cartons or shrink wrap.

Jar sizes are from 150 gram up to 3 kilo's. Vacuum packaging is completed with pasteurised brines.

Olives in brine with herbs and spices.

Dried herb and spices can be added to the containers at filling time in measured quantities. Typical Sicilian herbs used are chilli, garlic, rosemary, fennel and oregano. Small producers have secret herbs and spices used to represent the area from which they come.

Cracked green olives in oil with herbs.

Cracked olives after brining is complete are placed in a container and squashed to remove excess moisture, food acid or vinegar is added to lower the ph to 3.6. The olives are squashed again to remove any excess acidifier, are then packed with the selected herbs and warm water added and jars sealed. There are many different oils used, these include olive oil, canola oil, sunflower oil or a combination of the oils, depending on the flavour desired.

Value added products.

These olives can be de-pitted and utilised in a range of tapenade's, pastes and pate and salads, or bottled with other vegetables such as carrot, capsicum, celery and a range of hers to form an antipasto. These are usually packed in small containers for marketing.

Black olives in Sicily.

There is no commercial processing of black olives in Sicily, although some producers are trying to darken mature green olives with heat tunnels and colouring agents. Most black olives are either sun dried or salt dried in home style process. These are usually very bitter. Another process involves baking the olives in an oven and store them under oil with or without spices. These are also bitter, are used in cooking and pizza's.

Equipment .

Almost all the processors in Sicily used the 200 litre plastic barrel for their brining processes. Thousands of barrels are in secure yards, some on concrete and other on bitumen, in the sun to keep the temperatures up. The newest state of the art factory in Castelventrano has 5 ton fibreglass vats, suspended above the ground, feed by conveyor and gravity emptied.

The sorting machines are similar to those already in use in Australia, however there are as yet no commercial cracking machines available. Importation of the cracking machine is being explored, alternatively the manufacture of a machine will be investigated locally.

Filtering equipment for waste management will include a bank of filters from 20 micron down to 5 micron and a pasteurising unit for the reuse of brines. Any excess can be evaporated away or use a decellination plant leaving only water to recycle in the process facility.

The other equipment used is similar to that of most Australian table olive producers.

Conclusions:

- The process learnt in Sicily for processing green olives can be easily introduced into the Australian olive industry, with some modifications to facilities.
- Picking olives in their green state minimised the attack on fruit by pests, minimises pest control, and lends to easier harvesting.
- The waste management processes maximises recycling of mother brines and reduces impact on environment.
- The process would consume about 20% of the water needed to successfully process olives utilising the lye process.
- The industry needs to further explore varieties and cultivars in Australia that will crack and process green efficiently. Many existing varieties simply squash and do not crack evenly.
- Marketing of the cracked green olive requires marketing and promotion in the Australian context. Consumers have experienced a slit Kalamata Greek style black olive but not a cracked green olive on a commercial level.
- Small to medium size European processors may be forced to close because of their inability to properly treat their residues to meet the new Environmental Legislation in Europe. The Sicilian method meets these requirements.

Recommendations:

- Australian producers and processors of green olives seriously consider the Sicilian style of processing in preference to the current commercial process utilising lye.
- The benefits of this method be brought to the attention of the local and national olive industry through education, information and demonstrations of the cracked green olive processing.
- Introduce the process to Summerland Olive Products practices for green olives on a commercial scale during the 2008 harvest.
- Australian Olives producers undertake tour with Gino Russo to Sicily to witness first hand the most modern and environmentally friendly green olive processing.
- Use of mother brines in the finished product be promoted with the appropriate food safety measures in place.
- Promote waste management techniques in Australia .Re -use our precious resources and reduce waste products in our environment.